Surface Characterization of Pigmentary and Nanosize Metal Oxide Powders

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In this research program, the surface characterization of metal oxide powders used in pigmentary and nanoparticle applications (coatings, polymer systems, and photcatalysts) will be studied. The data obtained will then be used to study the reactivity, both photocatalytic and thermal, of these powders in different media. Traditional methods of phyiscochemical measurements to determine the composition, structure, and morphology [surface area, gas chemisorption, point of zero charge, XRD, XRF, and microscopy] will be combined with more advanced techniques of surface chemistry [electron emission spectroscopies (XPS and AES), vibrational and magnetic resonance spectroscopies (FTIR, Raman, EPR, and NMR), and ion scattering techniques (ISS and SIMS)].